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PATENT
Docket No. H 1215 PCT/US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Application of KLUTH, et al.

Serial No. 08/702,625
Filed: August 23, 1996
TITLE: FOAM PLASTIC FROM DISPOSABLE PRESSURIZED

Examiner: J. Cooney
Art Unit: 1711

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RESPONSE TO OFFICE ACTION

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

In response to the Official Action of March 5, 1999, applicants respectfully request that the rejection be reconsidered in light of the following discussion.

Before discussing the rejection over the prior art, applicants deem it prudent to set forth what they consider to be their invention. The invention is a system for the production of plastic foam comprising a disposable pressurized container containing a composition comprising at least one polyisocyanate or isocyanate prepolymer having a NCO content of from about 8 to 32% by weight based on the prepolymer, at least one catalyst for the reaction of an isocyanate group with an OH group, at least one blowing agent and at least one foam stabilizer. The system

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is characterized in that within 24 hours after application of the plastic foam from the disposable pressurized container, the residue left in the pressurized container has a diisocyanate monomer content of less than 5% by weight, based on the residual contents of the emptied container. The low content of diisocyanate monomer residue in the emptied container permits the emptied container to be disposed of as normal waste rather than requiring special disposal as a hazardous material. Applicants respectfully submit that the present invention is neither taught nor suggested by the prior art cited by the Examiner.

Claims 15-36 and 40-68 stand rejected under 35 U.S.C. 103(a) as unpatentable over Pauls (U.S. 4,263,412) in view of CA-2,084,698 (hereinafter noted as Canada) and Minato, et al. (US 5,086,175). Applicants respectfully submit that Pauls, Canada and Minato, et al., whether considered alone or in combination, neither teach nor suggest the present invention.

Pauls is related to the prior art disclosed by applicants. Pauls discloses a container for dispensing one component polyurethane foam from a container in which the foaming components are separated by a flexible membrane from the propelling gas. The device has the advantage that only small amounts of the foaming agent are required. The small amount of foaming agent permits selection from a broader range of foaming agents since certain useful foaming agents are soluble to a limited extent in the one component systems. Pauls represents the prior art cited by applicants.

Pauls discloses in the examples that the component of the mixture is introduced into the container and reacted therein (see examples 1 to 27 and column 8, lines 25 -29). As is known in the prior art, since the ratio of NCO groups to OH groups is preferably from 4 to 8, the amount of unreacted diisocyanate

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monomer in the contents of the container is high.

The large amount of unreacted diisocyanate in the contents of the Pauls container presents no problem. At column 7, lines 61-65, Pauls teaches:

"The inner container (1), the special shape of which permits virtually complete expulsion of the foamable prepolymer mixture containing isocyanate groups, consists either of aluminum or a resilient plastic, e.g., high pressure polyethelene." (Emphasis added by applicants.)

Applicants submit that since the Pauls device permits virtually complete expulsion of the foamable prepolymer mixture containing diisocyanate monomer from the container, there is no incentive to reduce the content of diisocyanate monomer in the contents of the container to low amounts. Operation of the Pauls container is similar to the operation of the container of Plaschka, et al., (US 4,508,244) of record, in that both containers are virtually completely emptied of the contents which contain the diisocyanate monomer.

The deficiencies in the teachings of Pauls and Plaschka, et al. are not cured by combination with Canada or Minato, et al. Canada and Minato, et al. disclose a composition having a low content of diisocyanate monomers which is useful for lacquers and adhesives. As set forth in the reference, Canada and Minato, et al. teach that a prepolymer is prepared using an excess of the diisocyanate monomer and the diisocyanate monomer is removed from the reaction mixture by a distillation process. The amount of unreacted diisocyanate monomer in the composition is less than 0.1% by weight of the composition in Canada. However, the composition with the low content of the unreacted diisocyanate is expensive to produce. One skilled in the art would have no incentive to include such an expensive material in the

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formulation used in the container of Pauls or Plaschka, et al. The Pauls and Plaschka, et al. containers permit virtually complete expulsion of the foamable prepolymer mixture and therefore the empty container does not present a disposal problem.

Applicants submit that as disclosed in Canada and Minato, et al., it was known in the art to prepare polyisocyanate containing compositions with a low content of diisocyanate monomer. However, these compositions were known for use in lacquers or adhesives. The lacquers and adhesives are relatively expensive materials which can afford the extra process steps in preparing the low diisocyanate monomer material. However, there would be no incentive for one skilled in the art to include the more expensive low diisocyanate content material in a container from which virtually all of the contents are expelled to reduce the expense of disposing of the container.

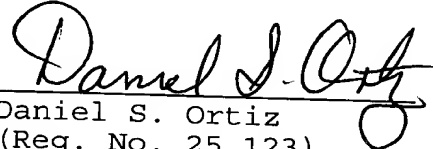
Applicants respectfully submit that the rejection over the combination of Pauls in view of Canada and Minato, et al. is improper. To formulate a rejection over a combination of references there must be some suggestion in the references to make the combination. Clearly, as pointed out above, the only suggestion to combine the teachings of the references is in the present application. Clearly one skilled in the art would not be led to including a low diisocyanate monomer content prepolymer in the container of Paul or Plaschka, et al., since the single component foaming mixture is virtually completely expelled from the container and the empty container would not present a disposal problem. Applicants therefore submit that the rejection is improper and request that it be withdrawn.

In view of the above discussion, applicants respectfully submit that the present invention is neither taught nor suggested

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by the combination of Pauls, Plaschka, et al., Canada and Minato, et al. Applicants respectfully request favorable consideration and allowance of the claims.

Respectfully submitted,


Daniel S. Ortiz
(Reg. No. 25,123)
Attorney for Applicant(s)
(610) 278-4920

Henkel Corporation
Patent Law Department
2500 Renaissance Boulevard, Suite 200
Gulph Mills, PA 19406

DSO/lmd